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Record of Decision:

CAMP LEJEUNE MILITARY RES. (USNAVY)
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09/15/1994

Text:

FINAL

INTERIM RECORD OF DECISION
CONTAMINATED SOIL
OPERABLE UNIT No. 10
SITE 35 - CAMP GEIGER AREA FUEL FARM

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

CONTRACT TASK ORDER 0160

AUGUST 31, 1994

Prepared For:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
Norfolk, Virginia

Under:
LANTDIV CLEAN Progrmn
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Prepared By:

BAKER ENVIRONMENTAL, INC.
Coraopolis, Pennsylvania

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LIST OF ACRONYMS AND ABBREVIATIONS

ARAR/TBC	Applicable or Relevant and Appropriate Requirement/To Be Consi (Criteria)
AST	aboveground storage tank
Baker	Baker Environmental, Inc.
bgs	below ground surface
CERCLA	Comprehenaive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulationa
COPC	contaminant of potential concern
CSA	Comprehensive Site Assessment
DOD	Department of Defenae
DON	Department of the Navy
EPA	United States Environmental Protection Agency
ESE	Environmental Science and Engineering, Inc.
FFS	Focused Feasibility Study
FS	Feasibility Study
IAS	Initial Assessment Study

IRP	Installation Restoration Program
MCB	Marine Corps Base
mg/kg	milligrams per kilogram
MTBE	methyl-tertiary butyl ether
NCDEHNR	North Carolina Department of Environment, Health, and Natural Resources
NCDOT	North Carolina Department of Transportation
NCP	National Oil and Hazardous Substances Pollution Contingency Pl
O&M	operation and maintenance
OU	Operable Unit
PRAP	Proposed Remedial Action Plan
RAA	remedial action alternative
RBC	Risk-Based Concentration
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
TPH	total petroleum hydrocarbons
USC	United States Code
USEPA	United States Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compounds

DECLARATION

Site Name and Location

Operable Unit No. 10 (Site 35)
Marine Corps Base
Camp Lejeune, North Carolina

Statement of Basis and Purpose

This decision document presents the selected remedy for contaminated soil
35), Marine Corps Base (MCB), Camp Lejeune, North Carolina which was chose
accordance with the Comprehensive Environmental Response, Compeneation, an
Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthori
(SARA), and, to the extent practicable, the National oil and Hazardous Sub
Contingency Plan (NCP). This decision is based on the Administrative Reco
unit.

The Department of the Navy (DON) and the Marine Corps have obtained concur State of North Carolina Department of Environment, Health and Natural Reso (NC DEHNR) and the United States Environmental Protection Agency (USEPA) R on the aelected remedy.

Assessment of the Site

Actual or threatened releases of hamrdous substances from this operable un by implementing the response action selected in this Record of Decision (R potential threat to public health, welfare, or the environment.

Description of Selected Remedy

Six Remedial Action Alternatives (RAAs) were evaluated as part of an Inter Action Remedial Investigation/Feasibility Study (RI/FS). RAA 3 (Source Re site Biotreatment) and RAA 5 (Source Removal and off-Site Soil Recycling) be roughly equivalent when compared using the established criteria. RAA 5 the preferred alternative because there are more off-site soil recycling f

the Camp Lejeeune area than off-site biotreatment facilities. The availab should make RAA 5 easier to implement. RAA 3 ha been identified as a poss however, subject to approval and modification of the Interim ROD.

The selected remedy, which is limited to contaminated soil, is an Interim representing only one phase of a comprehensive investigation and remediati Site 35. The level of petroleum hydrocarbons in soil identified at the si North Carolina guidelines. Furthermore, the contaminated soil represents of contamination of other media including groundwater, surface water, and

The selected remedy addressed in this ROD provides for the removal and tre contaminated soil to reduce the levels of contamination to below state gui mitigate the potential threat of future contamination. The major componen and 6 include:

- Excavating petroleum hydrocarbon contaminated soil located above t groundwater table which exhibit levels of total petroleum hydrocar excess of 40 mg/kg as determined via EPA Method 5030/8015 or 160 m determined via EPA Method 3550/8015.

- Staging excavated soil on site in piles designated as "clean" or " to allow for sampling and verification analysis.

- Transporting the contaminated soil off site to a permitted soil re (RAA 5).

- Backfilling the excavated areas with clean fill.

Declaration

This interim action is protective of human health and the environment, com and State applicable or relevant and appropriate requirements (ARARs) and considered (TBCs) directly associated with this action, and is cost-effect

utilizes permanent solutions and alternative treatment technologies to the
practicable, given the limited scope of the action. Because this action d
final remedy for Site 35, the statutory preference for remedies that emplo
reduces toxicity, mobility, or volume as a principal element for othermedi
groundwater, surface water, and sediment will be addressed at the time of

action. Subsequent actions are planned to address fully the principal thr
site.

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Signature (Commanding General, MCB Camp Lejeune) Date

1.0 SITE LOCATION AND DESCRIPTION

Camp Lejeune is a training base for the U.S. Marine Corps, located in Onsl
Carolina. The Base covers approximately 236 square miles and includes 14
MCB Camp Lejeune is bounded to the southeast by the Atlantic Ocean, to the
State Route 24, and to the west by U.S. Route 17. The town of Jacksonvill
located north of the Base (See Figure 1).

Camp Geiger is located at the extreme northwest corner of MCB, Camp Lejeun
County. The main entrance to Camp Geiger is off U.S. Route 17, approximat
southeast of the City of Jacksonville, North Carolina. Operable Unit (OU)
Camp Geiger Area Fuel Farm, refers primarily to five, 15,000-gallon aboveg
tanks (ASTs), a pump house, and a fuel unloading pad situated within Camp
of the intersection of Fourth and "G" Streets (See Figure 2). To date, th
been roughly bounded to the west by D Street, to the north by Second Stree
Brinson Creek, and to the south midway between Fourth and Fifth Streets.
of 13 operable units within MCB Camp Lejeune. An "operable unit" aa defin
National Oil and Hazardous Substancea Pollution Contingency Plan (NCP) ia
that comprisea an incremental step toward comprehensively addressing site

The aurface topography at Site 35 is generally flat to the south and west
ground surface dips rapidly to the north and east in the direction of Brin
surface drainage is toward Brinson Creek.

The shallow soil stratigraphy at Site 35 consists of fine to medium-graine
thick), underlain by colitic, fossiliferous limestone (6 to 20 feet thick)
underlain by a unit of silty sand.

Shallow groundwater flow direction iB generally west to east across the si
Brinson Creek. The top of groundwater is encountered roughly 8 to 10 feet
surface (bgs) across the net portion of the site and at lesser depths as t
converges with Brinson Creek.

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2.0 SITE HISTORY AND ENFORCEMENT ACTIVITIES

Construction of Camp Geiger was completed in 1945, four years after constr Camp Lejeune was initiated. Originally, the ASTs were used for the storag but, were later converted for storage of other petroleum products includin diesel fuel, and kerosene. The date of their conversion is not known. Th use at the site reported to be the original tanks.

Routinely, the ASTs at Site 35 supply fuel to an adjacent dispensing pump. underground line from the ASTs to the dispensing island was reported respo loss of roughly 30 gallons per day of gasoline over an unspecified period leaking line was subsequently sealed and replaced.

The ASTs at Site 35 are currently used to dispense gasoline, diesel and ke government vehicles and to supply USTs in use at Camp Geiger and the nearb Marine Corps Air Station. The ASTs are supplied by commercial carrier tru product to fill ports located on the fuel unloading pad at the southern en short-run (120 feet maximum), underground fuel lines are currently utilize product from the unloading pad to the ASTs. Product is dispensed from the and underground piping.

Reports of a release from an underground distribution line near one of the 1957-58 (ESE, 1990). Apparently, the leak occurred as the result of damag pump. At that time the Camp Lejeune Fire Department estimated that thousa fuel were released although records of the incident cannot be located. Th migrated to the east and northeast toward Brinson Creek. Interceptor tren excavated and the captured fuel was ignited and burned.

Another abandoned underground distribution line extended from the ASTs to Hall Heating Plant, located adjacent to "D" Street, between Third and Four underground line dispensed No. 6 fuel oil to an UST which fueled the Mess Mess Hall, located across "D" Street of the west, was demolished along wit in the 1960s.

In April 1990, an undetermined amount of fuel had been discovered by Camp along the unnamed drainage channels north of the Fuel Farm. Apparently, t

fuel, believed to be diesel or jet fuel, was an unauthorized discharge fro was never identified. The Activity reportedly initiated an emergency dean included the removal of approximately 20 cubic yards of soil

The Fuel Farm is scheduled to be decommissioned in 1994. Plans are curren to empty, clean, dismantle, and remove the ASTs along with all concrete fo grade, berms and associated underground piping. The Fuel Farm is being re

way for a four lane divided highway proposed by the North Carolina Departm Transportation (NCDOT).

Previow environmental investigations performed at Site 35 include the foll

Initial Assesement Study

In 1983, an Initial Assessment Study was conducted in which 76 potentially areas of concern were identified at the base (Water and Air Resources, 198 identified as one of 23 sites warranting further investigation. Sampling environmental media was not conducted during the Initial Aasesament Study.

Confirmation Study

ESE performed Confirmation Studies of the 22 sites requiring further inves investigated Site 35 between 1984 and 1987 (ESE, 1990). During this study three hand-auger borings and collected groundwater and soil samples from e Soils were analyzed for lead and oil and grease. Groundwater samples were oil and grease, and volatile organics. Lead was detected in soil samples auger borings at concentrations ranging from 6 to 8 mg/kg. Oil and grease concentrations ranging from 40 to 2,200 mg/kg.

In 1986, ESE collected sediment and surface water samples from Brinson Cre three permanent monitoring wells: two east of and one west of the Fuel Fa and sediment samples collected from nearby Brinson Creek were analyzed for grease and ethylene dibromide.

Lead and oil and grease were detected in samples taken from the three perm wells. Volatile organics were not detected at these well locations. Thea after inatallation and again in 1987.

Focused Feasibility Study

A Focused Feasibility Study (FFS) waa conducted in 1990 in the area north by NUS Corporation. The investigation induded the inatallation of four gr monitoring wells. Results of laboratory analysis revealed that groundwate soil cuttings from two borings were contaminated with petroleum hydrocarbo aqueous product was not observed.

A geophysical investigation was conducted by NUS as part of the FFS in an underground storage tanks (USTs) at the site of the former gas station. T the presence of a geophysical anomaly to the north of the former gas stati

Comprehensive Site Assessment

Law Engineering, Inc. (Law) conducted a Comprehensive Site Assessment (CS fall of 1991 (Law, 1992). The CSA involved the drilling of 18 soil boring from 15 to 44.5 feet. These soil borings were ultimately converted to nes the water table aquifer along two zones. The shallow zone, or water table extends from 2.5 to 17.5 feet bgs. The deeper zone monitored by the neste ranges from 17.5 to 35 feet bgs. Five additional soil borings were drille were hand-augered to provide data regarding soil contamination in the vado

Additional groundwater data was provided via 21 drive-point groundwater or samples. A "Tracer" study was also performed to investigate the integrity and underground distribution piping.

Soil and groundwater samples obtained under the CSA were analyzed for both inorganic compounds. Groundwater analyses included purgeable hydrocarbons purgeable aromatics and methyl-tertiary butyl ether (MTBE) (EPA 602), poly aromatic hydrocarbons (EPA 610), and unfiltered lead (EPA 239.2). Soil an limited to total petroleum hydrocarbons (TPH) (SW846 3rd Edition, 5030/355 (SW846 3rd Edition, 6010). Ten soil samples were analyzed for ignitabilit Edition, 1010.

The results of the CSA identified areas of impacted soil and groundwater. contamination included both halogenated (i.e., chlorinated) organic compou trichloroethene, trans-1,2-dichloroethene, and vinyl chloride) and nonhalo petroleum-based constituents (e.g., TPH, MTBE, benzene, toluene, ethylbenz The contamination encountered was typically identified in both shallow (2. and deep (17.5 to 35 feet bgs) wells.

The soil contamination identified under the CSA was located northwest of t ASTs along a pear-shaped area extending from the Explosive Ordnance Dispos Office and Supply Building (G-480) northeast toward Brinson Creek.

In general, contaminant concentrations in soil were greatest in those samp below the water table. Law concluded that this soil contamination at Site the presence of a dissolved phase groundwater plume and seasonal fluctuati table.

Law also identified several plumes of shallow groundwater contamination in plumes comprised primarily of petroleum-based constituents (e.g., BTEX) an comprised of halogenated organic compounds (e.g., TCE). The plumes are al Fourth Street and east of E Street except for a portion of a TCE plume tha beyond the corner of Fourth and E Streets.

A follow-up to the CSA was conducted by Law in 1992. Reported as an Adden (Law, 1993), it was designed to provide further characterization of the so petroleum contamination in shallow groundwater. Three monitoring wells we from which additional soil samples were obtained for TPH analysis. As par pump test was performed to estimate the hydraulic characteristics of the s This test was designed to determine performance characteristics of a desig and to estimate hydraulic parameters of the aquifer. An approximate hydra of 100 feet/day was determined for the surficial aquifer.

Interim Remedial Action Remedial Investigation/Feasibility Study

Based on the results of previous investigations at Site 35 and occasional odors along an adjoining section of Brinson Creek, Baker Environmental, In

retained to conduct an Interim Remedial Action Remedial Investigation/Feas (RI/FS) in December of 1993. An additional seven soil borings were locate

groundwater contaminant plume areas identified during the CSA. In additio borings, 13 ahallow soil samples were taken along Brinson Creek to determi contamination emanating from Site 35. Two of these shallow soil samples w upstream along Brinson Creek to provide background information on TPH and

In addition to soil sampling, a second round of groundwater level measurem for comparison to those presented in the CSA.

The most prevalent contaminants detected in soil samples taken during the Action RI were benzene, toluene, ethylbenzene xylenes, naphthalene, and 2-methylnaphthalene. These constituents are commonly associated with fuel c TPH (gasoline and diesel) and oil and grease were also observed, in additi occurrences of chromium, vanadium, and arsenic.

Analytical results, in general, confirm the Law fadings that contamination the identified soil is associated with a dissolved petroleum hydrocarbon c shallow groundwater. Oil and grease results observed in shallow soil samp the Brinaon Creek area may be influenced by the presence of naturally occu soils. This is supported by elevated background concentrations of oil and samples obtained along the banks of Brinson Creek approximately 1/2-mile u site and a lack of detectable levels of fuel-related volatile organics in elevated levels of oil and grease.

Comprehensive Remedial Investigation/Feasbility Study

Concurrent with the Interim Remedial Action RI/FS which is focused on cont Site 35, Baker is conducting a comprehensive RI/FS as a separate study to potentially impacted site media induding groundwater, surface water, and s activities for the full RI/FS were initiated in April 1994.

Other Investigations

Two USTs located near the Fuel Farm have been the subject of previous inve conducted under an Activity-wide UST program. The two USTs include a No.

situated adjacent to the former Mess Hall Heating Plant and a No. 2 fuel o adjacent to the Explosive Ordnance and Disposal Armory, Office, and Supply former was abandoned in place years ago (date unknown) and has been the su environmental investigations performed by ATEC Aasociates, Inc. and Law. removed in January 1994 and is reported to be scheduled for an upcoming co environmental investigation.

3.0 HIGHLIGHT OF COMMUNITY PARTICIPATION

The Final Interim Remedial Action RI/FS Report and the Final Interim Propo Action Plan (PRAP) for Site 35 were released to the public in July, 1994. were made available to the public at the information repository maintained County Library and Building 67, MCB, Camp Lejeune. The notice of availabi documents was published in the "Jacksonville Daily News" during the period 26, 1994. A public comment period was held from July 26 to August 26, 199 public meeting was held on July 26, 1994. At this meeting, representative Corps discussed the remedial action alternatives (RAAs) currently under co

addressed community concerns. Response to the comments received during th
period is included in the Responsiveness Summary, which is part of this RO

This decision document presents the three RAAs (3, 5, and 6) which have be
remediation of petroleum hydrocarbon contaminated soil at Site 35. These
chosen in accordance with the Comprehensive Environmental Response, Compen
Liability Act (CERCLA), aa amended by the Superfund Amendments and Reautho
(SARA) and, to the extent practicable, the NCP. The selected RAAs for Sit
Administrative Record.

4.0 SCOPE AND ROLE OF THE INTERIM REMEDIAL ACTION

The response action presented in this document is termed an Interim Remedi
it represents only one phase of a comprehensive investigation and remediat
Site 35. This interim phase is limited to contaminated soil at Site 35.
including groundwater, surface water, and sediments are concurrently being
part of a comprehensive site-wide RI/FS.

The results of the environmental investigations performed to date at Site
presence of soil areas contaminated with petroleum hydrocarbons at levels
state of North Carolina guidelines. The purpose of the selected remedy is
existing state guidelines and to mitigate the contaminated soil areas as p
future contamination of other media including groundwater, surface water,

5.0 SITE CHARACTERISTICS

This section of the Interim ROD presents an overview of the nature and ext
hydrocarbon soil contamination at Site 35. The analytical data generated
Interim Remedial Action RI and data generated during previous investigatio
Site 35 identified the presence of TPH contaminated soil in the vicinity o
and to the north and northwest of the Fuel Farm in a broad area extending
UST adjacent to the Explosive Ordnance Disposal Building to the vicinity o
MW-25. In general, the analytical data suggests that the majority of the
present along a narrow zone that begins just above the top of the shallow
In essence, this contaminated soil is an extension of groundwater contamin
been identified under the previous investigations and, particularly under
by Law. It can be assumed that seasonal fluctuations in the contaminated
has resulted in the contamination of soil just above the groundwater table
groundwater elevation data obtained to date is insufficient to afford an e
of groundwater fluctuation at Site 35. This is supported by data which ch
contamination present in soil located more than a foot or two above the sh
table as measured on two separate dates by Law and Baker. Contaminated so
encountered in soil samples obtained about two or more feet above the meas
surface at well MW-21 and MW-25 and at borings B-5.

Four areas of soil contamination requiring remediation have been identifie
depicted on Figure 3. The first area is located in the vicinity of the Fu
second area is associated with a UST formerly located on the north side of
other two areas are located north of the Fuel Farm and Building G-480. Th
other two areas is located along "F" Street and is based primarily on cont
samples located above the seasonal high groundwater table obtained from ha
HA-7, soil boring MW-21, and soil boring SB30. The smaller area is based

soil samples obtained from soil boring MW-25. Baker has estimated that ap
cubic yards (5,100 tons) of contaminated soil is present in these four are

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6.0 SUMMARY OF SITE RISKS

The baseline risk assessment conducted at Site 35 examined the potential f
health effects to occur subsequent to exposure to contaminated surface soi
present summaries of the frequencies of detection and comparisons to USEPA
commercial/industrial and residential risk-based concentrations (RBCs) whi
select the contaminants of potential concern (COPCs) for surface and subsu
respectively. Benzene and arsenic were identified as COPCs. Benzene was
20 soil samples at a maximum concentration of 23 mg/kg. Arsenic was detec
soil samples at a concentration of 8 mg/kg. Results of the baseline risk
that the unacceptable cancer risks and adverse noncarcinogenic health effe
potential on-site worker exposures will not occur. On-site workers were c
potential human receptors because of the proximity of soil contamination t
and proposed plans to construct a highway through the site. Results of th
assessment indicate that a no action remedy would be adequately protective
No ecological risk assessment was conducted as part of the Interim Remedia
because of the depths of the soil contamination limits possible ecological
contaminated soil. An ecological risk assessment will be conducted as par
comprehensive RI/FS that is being performed concurrently at Site 35.

Based on the results of the risk assessment, unacceptable human health ris
at Site 35. However, soil contaminated with elevated levels of petroleum
identified at several areas across the site. Results of TPH and oil and g
performed to date on soil samples from Site 35 are presented on Tables 4 a
goals for the remediation of petroleum hydrocarbon contaminated soil were
on NC DEHNR guidelines for soil remediation. The NC DEHNR guidelines addr
presence of low and high boiling point petroleum hydrocarbons and oil and
Remediation goals based on the NC DEHNR guidelines were developed by perfo
Sensitivity Evaluation (SSE). Based on the SSE remediation goals were dev

TPH (via EPA Method 5030/8015: low boiling point) = 40 mg/kg

TPH (via EPA Method 355018015: high boiling point) = 160 mg/kg

Oil and grease (via EPA Method 8071) = 800 mg/kg

Oil and grease was subsequently excluded from the remediation goals becaus
in background surface soil samples (BCSB11 and BCSB1B) located approximate

TABLE 1

DETECTED ORGANIC AND INORGANIC CONTAMINANTS IN SURFACE SOIL
COMPARISON TO COPC CRITERIA
INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL FARM
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Constituent	Frequency of Detection	Maximum Concentration (mg/kg)	RBC Value	Regi Comme Indus (m
Acetone	7/11	1.3J		10
Anthracene	1/11	0.28J		31
bis(2-ethylhexyl)phthalate	5/11	0.35J		
di-n-octyl phthalate	3/11	0.29J		2
Aluminum	11/11	4840L		10
Barium	3/11	31.9J		7
Calcium	11/11	23,600		
Chromium III	11/11	8.2L		10
Copper	1/11	8J		
Iron	11/11	6,350	--	--
Lead	3/11	69.2	*	*
Magnesium	11/11	1630L	--	--
Retained(1)				
Manganese	11/11	105		510
Mercury	11/11	0.27K	31	2.3
Nickel	3/11	8.3J	2,000	
Potassium	2/11	433L	--	
Retained(1)				
Selenium	1/11	0.25L	510	39
Retained				
Sodium	5/11	1,730L	--	--
Not Retained(1)				
Vanadium	8/11	18.1L	720	55
Retained				
Zinc	11/11	88.5	31,000	2,30
Retained				

Notes:

* RBCs for these constituents are not currently available.
(1) Not retained because of nutritional essentiality.

TABLE 2

DETECTED ORGANIC AND INORGANIC CONTAMINANTS IN SATURATED SOIL AND

COMPARISON TO COPC CRITERIA

INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL FARM
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Constituent	Frequency of Detection	Maximum Concentration (mg/kg)	RBC Value Commer Industr (m	Regi
Acetone	4/5	0.51J	1	
Ethybenzene	1/5	6.8	1	
Trichloroethene	2/5	0.007J		
Xylenes	1/5	13	2	
Dibenzofuran	1/5	3.1J		
Fluorene	1/5	5.6J		
Phenanthrene	1/5	6.7J		
Bis(2-ethylhexyl)phthalate	3/5	0.16J	200	
Di-n-octylphthalate	3/5	0.10J	2,000	
Naphthalene	1/5	7.1J	4,100	
2-Methyl naphthalene	1/5	34	--	-
Aluminum	5/5	4300L	300,000	Retained
Beryllium	1/5	0.08L	0.67	
Calcium	4/5	416J	--	Retained(1)
Chromium (III)	5/5	6.2L	100,000	Retained
Iron	5/5	2500J	--	- Retained(1)
Magnesium	3/5	133L	--	Retained(1)
Manganese	2/5	3.2	510	3 Retained
Mercury	2/5	0.08K	31	
Vanadium	1/5	7.8L	720	5 Retained
Zinc	1/5	20.4	31,000	

Notes:

* RBCs for these constituents are not currntly available.
(1) Not retained because of nutritional essentiality.

TABLE 3

DETECTED ORGANIC AND INORGANIC CONTAMINANTS IN SATURATED SOIL AND
COMPARISON TO COPC CRITERIA
INTERIM RECORD OF DECISION

SITE 35 - CAMP GEIGER FUEL FARM
MCB CAMP LEJEUNE
JACKSONVILLE, NORTH CAROLINA

Constituent	Frequency of Detection	Maximum Concentration (mg/kg)	RBC Value Regio Commer Indust (m
Acetone	1/4	0.051J	10
Benzene	2/4	23	
2-Hexanone	3/4	12J	
Toluene	2/4	190J	20
Ethylbenzene	3/4	70	10
Xylene	3/4	320	200
Dibenzofuran	2/4	10J	
Fluorene	3/4	13J	4
Phenanthrene	3/4	27	3
Bis(2-ethylhexyl)phthalate	1/4	0.12J	200
Di-n-octylphthalate	1/4	0.1J	2,000 160
Naphthalene	3/4	43	4,100
Retained			
2-Methylnaphthalene	3/4	130	--
Aluminum	4/4	4,480L	300,000 23,
Retained			
Arsenic	1/4	8	1.6
Chromium (III)	4/4	20.5L	100,000 7,
Iron	4/4	6,140J	-- --
Magnesium	4/4	186	-- --
Manganese	3/4	8.9	510 39
Vanadium	2/4	22.9L	720
Retained			

Notes:

* RBCs for these constituents are not currently available.
(1) Not retained because of nutritional essentially.

TABLE 4

SOIL TPH RESULTS FROM THE CSA (LAW, 1992
INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL FARM
MCB CAMP LEJEUNE, NORTH CAROLINA

LOCATION	SAMPLE DEPTH (bgs)	SAMPLE TO	PID READING	SAMPLE ANALYZED	ANALYTICAL RESULTS (mg/k TPH TABLE

	(ft)	(ppm)		DIESEL	GASOLINE
MW-8	1.5-2.0	8			
	3.5-4.0	3			
	5.5-6.0	55			
	7.5-8.0	85	*	9100	ND
	9.5-10.0	42			
	11.5-12.0	4			
MW-9	1.5-2.0	ND			
	3.5-4.0	ND			
	5.5-6.0	ND			
	7.5-8.0	ND	*	ND	ND
	9.6-10.0	ND			
MW-10	1.5-2.0	>2000	*	ND	ND
	3.5-4.0	220	*	ND	ND
	5.5-6.0	105			
MW-11	1.5-2.0	ND			
	3.5-4.0	1.5			
	5.5-6.0	30	*	2100	ND
	10-10.5	31	*	4	ND
MW-12	0-1.5	>2000	*	ND	ND
	1.5-3.0	75			
	3.0-4.5	200	*	ND	ND
	8.5-10	45			
MW-13	1.5-2.0	ND			
	3.5-4.0	ND			
	5.5-6.0	ND			
	10.0-10.5	ND	*	ND	ND

Notes:
ppm - parts per million
* - Indicates which sample interval was for laboratory analysis
ND - Not detected
NA - Not available
bgs - below ground surface
(1) - Water level measurements obtained by Baker

TABLE 4 (Continued)

SOIL TPH RESULTS FROM THE CSA (LAW, 1992
INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL FARM
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE LOCATION	SAMPLE DEPTH (bgs) TO	PID READING	SAMPLE ANALYZED	ANALYTICAL RESULTS (mg/k TPH TABLE	
	(ft)	(ppm)		DIESEL	GASOLINE
MW-14	0-1.5	ND			
	1.5-3.0	3			
	3.0-4.5	60	*	0.3	ND
	8.5-10.5	16			
	13.5-15.0	3			

MW-15	1.5-2.0	ND					
	3.5-4.0	ND					
	5.5-6.0	ND		*	ND		ND
	10.0-10.5	65	*	3500		ND	
MW-16	0-1.5	30					
	1.5-3.0	110					
	3.0-4.5	200		*	ND		ND
	8.5-10.0	155					
MW-17	1.5-2.0	ND					
	3.5-4.0	ND					
	5.5-6.0	ND		*	ND		ND
	10-10.5	ND					
MW-19	1.5-2.0	ND					
	3.5-4.0	ND		*	ND		ND
	5.5-6.0	ND					
	10.0-10.5	ND		*	ND		ND
MW-20	0-1.5	40					
	1.5-3.0	65		*			
	3.0-4.5	ND					
	8.5-10.5	220	*	22000		ND	

Notes:
ppm - parts per million
* - Indicates which sample interval was for laboratory analysis
ND - Not detected
NA - Not available
bgs - below ground surface
(1) - Water level measurements obtained by Baker

TABLE 4 (Continued)

SOIL TPH RESULTS FROM THE CSA (LAW, 1992
INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL FARM
MCB CAMP LEJEUNE, NORTH CAROLINA

LOCATION	SAMPLE DEPTH (bgs) TO (ft)	SAMPLE PID READING (ppm)		SAMPLE ANALYZED	ANALYTICAL RESULTS (mg/k TPH TABLE DIESEL		GASOLINE
MW-21	1.5-2.0	ND					
	3.5-4.0	60		*	5200		ND
	5.5-6.0	75	*	21000		ND	
	10-10.5	35					
MW-22	0-1.5	10					
	1.5-3.0	2					
	3.0-4.5	150		*	5		ND
	9.5-11.0	90	*	8900		540	
MW-23	1.5-2.0	ND		*	ND		ND

	3.5-4.0	ND				3.15
	5.5-6.0	ND				
	10-10.5	ND				
MW-24	1.5-2.0	ND				
	3.5-4.0	ND	*	ND		ND
	5.5-6.0	ND				
	10-10.5	3	*	21		ND
MW-25	1.5-2.0	22				
	3.5-4.0	45	*	8700		ND
	5.5-6.0	45	*	5700		ND
	10.0-10.5	2.5				
MW-26	0-1.5	ND				
	1.5-3.0	ND	*	ND		ND
	3.0-4.5	ND				
	6.0-7.5	ND	*	ND		ND
	9.5-11.0	ND				

Notes:
ppm - parts per million
* - Indicates which sample interval was for laboratory analysis
ND - Not detected
NA - Not available
bgs - below ground surface
(1) - Water level measurements obtained by Baker

TABLE 4 (continued)
SOIL TPH RESULTS FROM THE CSA (LAW,
INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL F
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE LOCATION	SAMPLE DEPTH (bgs) To (ft)	PID READING (ppm)	SAMPLE ANALYZED	ANALYTICAL RESULTS (mg/k TPH TABLE DIESEL	GASOLINE
MW-27					
	0.1.5	ND	*	ND	ND
	1.5-3.0	ND			
	3.0-4.5	ND			
	6.0-7.5	ND	*	ND	ND
	9.5-11.0	ND			
PW-28	0-1.5	ND			
	1.5-3.0	ND			
	3.0.4.5	ND	*	ND	ND
	6.0-7.5	ND			
	9.5-11.0	ND	*	ND	ND
B-1	0-1.5	200			
	1.5-3.0	160	*	ND	ND
	3-4.5	40			
	8.5-10.0	140	*	ND	ND
B-2	2.0-2.5	3			

		3.0-3.5	2			
		4.0-4.5	8			
		5.0-5.5	7.5			
		5.5-6.0	12	*	ND	ND
		8.5-10	51	*	7600	630
	B4	0-1.5	0			
		1.5-3.0	11			
		3.0-4.5	22	*	8400	ND
		8.5-10.0	50	*	5100	ND
	8-5	0-1.5	ND			
		1.5-3.0	ND			
		3.0-4.5	20	*	980	ND
		8.5-10.0	2	*	280	ND

Notes:
ppm - parts per million
* - Indicates which sample interval was for laboratory analysis
ND - Not detected
NA - Not available
bgs - below ground surface
(1) - Water level measurements obtained by Baker

TABLE 4 (continued)
SOIL TPH RESULTS FROM THE CSA (LAW,
INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL F
MCB CAMP LEJEUNE, NORTH CAROLINA

SAMPLE LOCATION	SAMPLE DEPTH (bgs) To (ft)	PID READING (ppm)	SAMPLE ANALYZED	ANALYTICAL RESULTS (mg/k TPH TABLE DIESEL	GASOLINE
B-6	0.15	2			
	1.5-3.0	ND			
	3.0-4.5	ND	*	7	ND
	8.5-10	50	*	6200	ND
SB-3	0-1.5	ND			
	1.5-3.0	ND			
	3.0-4.5	9	*	ND	ND
	8.5-10	10	*	ND	ND
HA-3	2	2	*	17	ND
	4	5			
HA-4	2	4	*	ND	ND
	5	3			
HA-7	3 10				
	5	60	*	5700	
HA-8	5	8		NA	NA
HA-9	3	ND		NA	NA
	5	8		NA	NA

Notes:

ppm - parts per million
* - Indicates which sample interval was for laboratory analysis
ND - Not detected
NA - Not available
bgs - below ground surface
(1) - Water level measurements obtained by Baker

TABLE 5
SOIL TPH, OIL AND GREASE RESULTS (BAKER, 19
INTERIM RECORD OF DECISION
SITE 35 - CAMP GEIGER AREA FUEL FARM
MCB CAMP LEJEUNE, NORTH CAROLINA

Sample No.	SB2903	SB3003	SB3005	SB305D	SB3102	BCSB01	BCSB02	BCSB03
Depth (ft)	4-6	4-6	8-10	8-10	2-4			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg		
TOTAL PETROLEUM HYDROCARBONS								
Gasoline	ND	650	1300	1400	ND	ND		
Diesel	ND	3500	6800	6800	ND	ND		
OIL AND GREASE	290	7800	16000	16000	440	930	1300	

Semple No.	BCSB03D	BCSB04	BCSB05	BCSB06	BCSB07	BCSB11	BCSB12	BCSB13
Depth (R)	0-1	0-1	0-1	0-1	0-1			
Units	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg			
TOTAL PETROLEUM HYDROCARBONS								
Gasoline	ND	ND	ND	ND	ND			
Diesel	ND	ND	ND	ND	ND			
OIL AND GREASE	1300	390	970	1900	1600	321		

Notes:
ND - Not deteckd

mile upstream of the Fuel Farm at levels on the order of 1610 mg/kg and 11
respectively, or more than twice the remediation goal based on the SSE. S
measurements indicate the locations of the upstream surface soil samples t
reach of tidal influences and, consequently, indicate that high levels of
organic chemicals are present in the soil adjacent to Brinson Creek and li
high oil and grease results. Although other surface soil samples obtained

Remedial Action RI indicated the presence of oil and grease at levels as h only one of the surface soil samples (BSCB01) exhibited both detectable co (60 mg/kg) and oil and grease (3,000 mg/kg). The discrepancy is likely du and grease is a gravimetric analysis which is highly subject to interferen such as those presented by many naturally-occurring organic chemicals that to be present in the frequently flooded soils adjacent to Brinson Creek.

Based on the remediation goals, soils exhibiting TPH levels in excess of 4 by EPA Method 5030/8015 and 160 mg/kg as measured by EPA Method 3550/8015 subject to remediation.

7.0 DESCRIPTION OF ALTERNATIVES

Various technologies and process options were screened and evaluated under Remedial Action FS. Ultimately, six Remedial Action Alternatives (RAAs) w and are listed as follows:

RAA 1 - No Action
RAA 2 - Source Removal and Off-Site Landfill Disposal
RAA 3 - Source Removal and Off-Site Biotreatment
RAA 4 - Source Removal and On-Site, Ex-Situ Soil Aeration
RAA 5 - Source Removal and Off-Site Soil Recycling
RAA 6 - Source Removal and On-Site Low Temperature Thermal Desorptio

A brief description of each alternative as well as the estimated cost and implement the alternative are as follows:

RAA 1 - No Action

Capital Cost: $0
Annual Operation and Maintenance (O&M) Cost: $0
Months to Implement: 0

The No Action RAA is required under CERCLA to establish a baseline for com Under this RAA, no actions will be performed to reduce the toxicity, mobil volume of the contaminated soil at Site 35. This alternative assumes that remediation will occur via biodegradation and other natural attenuation pr that contaminant levels will be reduced over an indefinite period of time.

RAA 2 - Source Removal and off-Site Landfill Disposal

Capital Cost: $527.390
Annual O&M Cost: $0
Months to Implement: 2

Under RAA 2, contaminated soil located above the seasonal high groundwater will be excavated and transported off site to an appropriately permitted s landfill.

RAA 3 - Source Removal and Off-Site Biotreatment

Capital Coat: $558,366

Annual O&M Cost: $0
Months to Implement: 2

RAA 3 involves the excavation of contaminated soil above the seasona groundwater table and biological treatment at an off-site commercial landfarming facility. Biological treatment is a process whereby nat microorganiams are stimulated to consume petroleum hydrocarbons as f with the resulting byproducts being carbon dioxide and water.

RAA 4 - Source Removal and On-Site, Ex-Situ Soil Aeration

Capital Coat: $455,304
Annual O&M Cost: $0
Months to Implement: 2

RAA 4 involves the excavation of petroleum hydrocarbon contaminated seasonal high groundwater table for remediation via on-site, ex-site this process the excavated soil is vigorously agitated at a staging release volatile hydrocarbons from the soil to the atmosphere.

RAA 5 - Source Removal and Off-Site Soil Recycling

Capital Cost: $558,366
Annual O&M Cost: $0
Months to Implement: 2

RAA 5 involves the excavation of contaminated soil located above the groundwater table and transport to an off-site commercial soil recyc recycling processes utilize the soil for the production of basic mat and asphalt.

RAA 6 - Source Removal and On-Site Low Temperature Thermal Desorptio

Capital Cost: $613,542
Annual O&M Cost: $0
Months to Implement: 2

RAA 6 involves the excavation of contaminated soil located above the groundwater table for remediation via on-site low temperature therma This process is commercially available from contractors that utilize heat wastes to between 200 and 600 degrees Fahrenheit. The heat vol contaminants which are then either collected in activated carbon, de catalytic oxidation, or released to the atmosphere.

8.0 SUMMARY OF COMPARATIVE ANALYSIS OF ALTERNATIVES

A detailed analysis was performed on the RAAs using the nine evaluation cr select a site remedy. Table 6 presents a summary of this detailed analysi of each alternative's strengths and weaknesses with respect to the evaluat A glossary of the evaluation criteria is noted on Table 7.

Overall Protection of Human Health and the Environment

All of the RAAs except the No Action RAA will provide for an increase in t protection of human health and the environment. The greatest degree of pr provided by RAAs 2, 3, and 5 which involve source removal and disposal/tre aite facility. Under these alternatives, after the contaminated soil is e from the site, clean borrow will be used as backfill. RAAs 4 and 6, on th the soil treated on site as backfill material. It is likely that some res

TABLE 6

SUMMARY OF ALTERNATIVES EVALUATION
INTERIM RECORD OF DECISION, CTO-0160
SITE 35 - CAMP GEIGER AREA FUEL FARM, MARINE CORPS BASE, CAMP LEJEU CAROLINA

	Alternative I: No Action	Alternative 3: Source Removal and Biotreatment
Overall Protection of Human Health and Environment	No reduction in potential risks.	Removes contaminated soil from site thereby eliminating potential exposure to and contaminants.
Compliance with ARARs		
Chemical-Specific ARARs	Does notmeet NC DEHNR guidelines for T	DEHNR guidelines for remediation. Will comply with NC DEHNR guidelines for soil remediation.
Location-Specific ARARs	Contaminated soils left in place under	risks to wetlands, the floodplain, and endangered species in the area. Source removal will reduce risks to wetlands, could impact wetlands and, in turn, fi wildlife.
Action-Specific ARARs	Not relevant. There are no actions.	guidelines for Will comply with NC DEHNR guidelines for
Long-Term Effectiveness and Permanence	Source remains in place. Natural atte	is permanently Contaminated soil as a source is permanently removed from site. may reduce contaminant levels, but is unpredictable.
Reduction of Toxicity, Mobility,	Natural attenuation may reduce contami	

volume of soil removed. Total reduction equal to volume of soil removed.
or Volume levels, but is unpredictable.

Short-Term Effectiveness No increased risk to community and no
release VOCs Excavation and handling would release VOCs
workers because no remedial action is
2 to atmosphere. Work to be completed in 1 to 2
implemented.

Implementability Nothing to Implement.
Standard construction operation. Easy to

implement. Commercial vendors available.

Costs
Capital $0
O&M $0

USEPA/State Acceptance USEPA and state will likely not prefer
to favor USEPA has a Federal mandate to favor
alternative.
treatment over disposal options. State has

for on-site versus off-site treatment.

TABLE 6 (Continued)

SUMMARY OF ALTERNATIVES EVALUATION
INTERIM RECORD OF DECISION, CTO-0160
SITE 35 - CAMP GEIGER AREA FUEL FARM, MARINE CORPS BASE, CAMP LEJEUNE
CAROLINA

Alternative 4: Source Removal and On-
Off-Site Alternative 6: Source Removal and On-Site
Situ Soil Aeration
Temperature Thermal Desorption

Overall Protection of Human Risks reduced, but not perhaps not to
from site, thereby Risks reduced, but not perhaps not to the degree
Health and Enviromnent of other alternatives because treated
and of other alternatives because treated soil is used
as backfill.
Compliance with ARARs

Chemical-Specific ARARs Will comply with NC DEHNR guidelines f
DEHNR guidelines for Will comply with NC DEHNR guidelines for
TPH soil remediation.
remediation.

Location-Specific ARARs Will reduce risks to wetlands, the flo
risks to wetlands, Will reduce risks to wetlands, the floodplain,

		and endangered epecies in the Camp Lej
the	and endangered species in the	Camp Lejeune
		area, but not perhaps to degree of oth
area, but not perhaps to degree of other		
		alternatives because treated soil is u
because treated soil is used as		
		backfill.
	Action-Specific ARARs	Will compy with NC DEHNR guidelines fo
DEHNR guidelines for	Will comply with NC DEHNR guidelines for	
		disposal/treatment.
disposal/treatment.		
	Long-Term Effectiveness and	Reductions in contaminant achieved via
source ia permanently	Reductions	in contaminant achieved via on-site
	Permanence	treatment will be permanent. No long-
treatment will be permanent.	No long-term	
		monitoring required.
required.		
	Reduction of Toxicity, Mobility,	Total reduction is equal to volume of
volume of soil removed.	Total reduction	is equal to volume of soil treated
	or Volume	and total reduction of contaminant lev
total reduction of contaminant levels.		
	Short-Term Effectiveness	Excavation, handling, and treatment wo
release VOCs	Excavation and handling would release VOCs	
		release VOCs to atmosphere during
2	to atmosphere. Work to be completed in 1 to 2	
		construction.
	Implementability	Standard construction operation for ex
Easy to	Standard construction	operation. Easy to
		and treatment. No special equipment r
available.	implement. Commercial vendors available.	
	Costs	
	Capital	$455,304
	O&M	$0
	USEPA/State Acceptance	Potential objections regarding unrestr
to favor	USEPA has a Federal mandate to favor	
		VOC emissions during treatment. Engin
has	treatment over diaposal options. State has	
		controls may be required.
preference for on-site versus off-site treatment.		

TABLE 7

GLOSSARY OF EVALUATION CRITERIA

Overall Protection of Human Health and Environment - addresses whether not an alternative provides adequate protection and describes how risks through each pathway are eliminated, reduced, or controlled through tre engineering controls or institutional controls.

Compliance with ARARs/TBCs - addresses whether or not an alternative wi all of the applicable or relevant and appropriate requirements (ARARs), to be considered (TBCs), or other Federal and State environmental statu provide grounds for invoking a waiver.

Long-term Effectiveness and Permanence - refers to the magnitude of res risk and the ability of an alternative to maintain reliable protection and the enviromnent over time once cleanup goals have been met.

Reduction of Toxicity, Mobility, or Volume through Treatment - entails anticipated performance of the treatment options that may be employed i alternative.

Short-term Effectiveness - refers to the speed with which the alternati protection, as well as the remedy's potential to create adverse impacts health and the environment that may result during the construction and implementation period.

Implementability - entails the technical and administrative feasibility alternative, including the availability of materials and services neede the chosen solution.

Cost - includes capital and operation and maintenance costs. For compa purposes, presents present worth values.

USEPA/State Acceptance - Evaluates the technical and administrative iss concerns the USEPA and State have regarding each of the alternatives. is addressed in the ROD once comments on the RI/FS report and PRAP have received.

Community Acceptance - Evaluates the issues and concerns the public may regarding each of the alternatives. This criterion is addressed in the comments on the RI/FS report and the PRAP have been received.

contaminants will remain in the post-treated soil although the levels, by the remediation goals established in the FS. Consequently, the post-treat will not provide as great a degree of overall protection as the clean back RAAs 2, 3, and 5. However, the difference may largely be insignificant gi highway will be constructed over the site.

Compliance with ARARs

A summary of ARARs/TBCs that pertain to the Interim Remedial Action are pr Table 8. All of the RAAs except the No Action RAA will comply with all of ARARs. The source removal actions must be executed to comply with NC DEHN which TBCs were identified as chemical-specific ARARs/TBCs and used as the remediation goals establiahed under this FS. In addition, NC DEHNR guidel and disposing of contaminated soil are action-specific ARARs/TBCs. It is

commercial vendors contracted to treat the soil either on site or off site will be pre-approved, appropriately permitted, or otherwise in compliance NC DEHNR rules and guidelines. Under RAA 2, it is assumed that the propos be permitted to accept non-hazardous, petroleum contaminated soil. The ex proposed under RAA 4 will likely be performed by the excavation contractor does not appear to be available locally as a specialized service. It is p will not be completely effective and that some portion of the contaminated be disposed/treated by an alternative means in order to comply with ARARs.

Long-Term Effectiveness and Permanence

All of the RAAs except the No Action RAA provide for an effective and perm which does not require any long-term soil monitoring.

Reduction of Toxicity, Mobility, or Volume of Contaminants

All of the RAAs except the No Action RAA provide for the reduction of toxi volume of contaminants. Under RAAs 2, 3, and 5, where the contaminated so excavated and treated/disposed off site, the overall reduction is based st contaminated soil removed. RAAs 4 and 6, however, involve the on-site tre of the soil as backfill meaning that the total reduction is dependent both

TABLE 8

SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRLATE REQUIREMENTS AND CRITERI TO BE CONSIDERED

INTERIM RECORD OF DECISION, CTO-0160
SITE 35, CAMP GEIGER AREA FUEL FARM
MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

ARAR/TBC Type	Standard, Requirement, Criteria, or Limitation	D
Chemical-Specific	NCDEHNR guidelines for soil remediation (NCDEHNR, Division of Environmental Management, Groundwater Section, March 1993)	Provides a mean chemical compounds are soil cleanup le unless characterizatio hydrocarbons are present
Location-Specific	Endangered Species Act (50 CFR Part 200 and Part 402)	Requires action species have been identified species within will be applicable which endangere found at involves consul Department of I
Location-Specific	Fish and Wildlife Coordination Act	Requires action

located adjacent to OU		
	(16 USC 661-666)	wildlife from a actions are
		or areas affect
Location-Specific of Wetland Inventory	Executive Order 11990 on	Establishes spe
	Protection of Wetlands contiguous to	federal agencie
	(40 CFR 6) remedial	impacts associa
		of loss of wetl
Location-Specific floodplain of Brinson Creek	Executive Order 11988 on	Establishes spe
	Floodplain Management remedial actions are	federal agencie
		impacts associa indirect floodp an

TABLE 8 (Continued)

SUMMARY OF APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND CRITERI BE CONSIDERED

INTERIM RECORD OF DECISION, CTO-0160
SITE 35, CAMP GEIGER AREA FUEL FARM
MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

ARAR/TBC Type	Standard, Requirement, Criteria, or Limitation	
Action-Specific may be applicable for	Clean Air Act - National Ambient	Federal air sta
	Air Quality Standards (40 CFR 50)	criteria pollut
Action-Specific due to the	Clean Water Act	Prohibits disch
	(33 USC 404) with	material into a
		permit.
Action-Specific and off-site treatment and	NCDEHNR guidelines for soil	Providea guidel
	remediation actions	various remedia petroleum hydro
	(NCDEHNR Division of Environmental Management,	

Groundwater Section, March 1993)

removed and the total reduction of contaminant levels. The difference sho significant since all of the remediation goals will be achieved by design.

Short-Term Effectiveness

The short term effectiveness of the action oriented RAAs (2 through 6) are It is expected that each RAA will be fully implemented in about two months will be expected during the excavation and staging activities of each RAA. VOC emissions can be expected under RAA 4 because the soil aeration procea intended to release the VOCs from the soil to the atmosphere.

Implementability

RAAs 2, 3, and 5 will be roughly equivalent to implement. Each of these R mobilization of construction equipment to the site for the performance of staging, and backfilling operations, and the off-site treatmenT/disposal o soil.

Since RAAs 3 and 5 involve off-site commercial biotreatment and soil recyc can be reasoned that the RAA that offers more vendors would be more flexib implement. Baker identified more soil recycling facilities than biotreatm service the Camp Lejeune area. Consequently, RAA 5 (Source Removal and of recycling) was evaluated as easier to implement than RAA 3 (Source Removal Biotreatment).

RAAs 4 and 6 involve on-site treatment and disposal which will be more dif because more on-site activities will be involved. A staging area will nee each RAA to provide a location where the excavated soil can be placed to b segregated as either clean or contaminated and await treatment/disposal. assume that the staging area for the on-site RAAs 4 and 6 may need to be l for on-site treatment activities.

RAAs 2 through 6 will require the construction of a decontamination area f personnel. All of the anticipated site activities involve standard constr equipment, and materials and should be relatively easy to implement.

Cost

The estimated costs of alternatives, excluding the No Action alternative, approximately $455,000 for RAA 4 (Source Removal and On-Site, Ex-Situ Soil approximately S613,000 for RAA 6 (Source Removal and On-Site Low Temperatu Desorption). Although RAA 4 is estimated to be the lowest cost option it (Source Removal and Off-Site Landfill Disposal), the alternative most like from the USEPA and NC DEHNR. These objections will likely pertain to the intention of this alternative to release VOCs from the soil to the atmosph uncontrolled manner. In addition, RAA 4 is the only alternative which inv that is not commercially supplied by specialty contractors. It is the opt best chance of not performing as expected and, therefore, has the highest increased costs. The contingency for RAA 4 at 25 percent is the highest o

which represents an attempt to recognize the uncertainties of this option.
alternatives in terms of cost is as follows:

RAA 1:	No Action	$0
RAA 4:	Source Removal and On-Site, Ex-Situ Soil Aeration	$455,304
RAA 2:	Source Removal and Off-Site Landfill Disposal	$527,390
RAA 3:	Source Removal and Off-Site Biotreatment	$558,366
RAA 5:	Source Removal and Off-Site Soil Recycling	$558,366
RAA 6:	Source Removal and On-Site Low Temperature	$613,542

All of the costs shown are capital costs because none of the RAAs have any operation and maintenance activities associated with them. In all cases, treatment/disposal was the most significant variable. The next most signi the cost of off-site transportation of waste. The cost of transportation for all of the RAAs except RAA 4 are based on telephone quotations from co specifically for this project. The cost of on-site treatment under RAA 4 estimated time and equipment required to execute this task rather than a q commercial vendor because a contractor that specializes in providing this identified.

USEPA/State Acceptance

Neither the USEPA or NC DEHNR is likely to favor RAA 1 - No Action because result in compliance with ARARs.

The USEPA is mandated to favor treatment over disposal alternatives and, t Source Removal and Off-Site Landfill Disposal will not likely be as accept alternatives that feature treatment. The placement of non-hazardous, petr contaminated soil in an approved, permitted landfill is a common practice and will likely be acceptable to the NC DEHNR.

RAAs 3 through 6 all involve source removal and either on-site or off-site general, the NC DEHNR states its preference is toward remedial actions per However, the state will accept remedial actions performed at appropriately commercial facilities. Only RAA 4 - Source Removal and On-Site, Ex-Situ S likely to be confronted with objections by either the USEPA or NC DEHNR. of the objections will be that this alternative, by design, allows VOCs to atmosphere rather than be collected or destroyed as is the case in the oth

Community Acceptance

To be addressed following public comment.

9.0 SELECTED REMEDY

All of the alternatives, except for RAA 1 - No Action will result in a per

toxicity, mobility, and volume of waste at Site 35, comply with ARARs, ach remediation goals, and contribute to the overall protection of human healt environment. In general, alternatives include RAA 3, 5, and 6 are conside technically equivalent overall. Based on estimated costs, RAAs 3 and 5 ap effective than RAA 6. RAA 5 (Source Removal and Off-Site Soil Recycling) alternative in lieu of RAA 3 (Source Removal and Off-Site Biotreatment). for selecting RAA 5 over RAA 3 is that more off-site commercial soil recyc the Camp Lejeune area than off-site commercial biotreatment facilities whi RAA 5 easier to implement.

Aside from RAA 1 - No Action, the other alternatives which were not select Source Removal and Off-Site Disposal and RAA 4 - Source Removal and On-Sit Aeration. RAA 2 involves a technology based on the transfer of the contam site where its effects are uncontrolled to a secure, appropriately permitt environmental impacts are routinely monitored. Unlike RAA 3 through RAA 6 not include any provision for waste treatment and, therefore, was not sele preferred alternatives. RAA 4 - Source Removal and On-Site, Ex-Situ Soil other hand, does involve soil treatment via aeration; a process designed t contaminants directly to the atmosphere in an uncontrolled manner. The ot treatment oriented RAAs 3, 5, and 6 involve processes whereby the contamin biologically metabolized (RAA 3), utilized in the production of basic mate physically captured or destroyed (RAA 6). The fact that the contaminanta another media (air) rather than being captured or destroyed coupled with a of uncertainty as to the potential overall effectiveness of soil aeration RAA 4 not being selected as the preferred alternative.

Remedy Description

The major components of RAAs 5 include:

- Excavating contaminated soil located above the seasonal high ground which have TPH concentrations exceeding 40 mg/kg via EPA Method 503 160 mg/kg via EPA Method 3550/8015.

- Staging excavated soil on site in piles designated "clean" or "cont verification sampling and analysis.

- Transporting the contaminated soil off site to a permitted soil rec recycling refers to a manufacturing process that utilizes petroleum contaminated soil in the production of bricks..

- Backfilling the excavations with clean fill.

Estimated Costs

The estimated cost of RAA 5 including a breakdown of major cost components Table 9.

No annual O&M costs are associated with RAA 5 since this alternative would less than one year. Consequently, the net present worth of RAA 5 is equal

cost. It is important to note that the cost estimate was calculated for t should not be considered a construction-quality estimate. An FS cost esti accuracy of +50 or -30 percent (EPA, 1988).

10.0 STATUTORY DETERMINATIONS

A selected remedy should satisfy the statutory requirements of CERCLA Sect include: (1) be protective of human health and the environment, (2) compl cost-effective, (4) utilize permanent solutions and alternative treatment resource recovery technologies to the maximum extent practicable; and (5) preference for treatment that reduces toxicity, mobility, or volume as a p provide an explanation as to why this preference is not satisfied. The ev satisfies these requirements for Site 35 is presented below.

Protection of Human Health and the Environment

RAA 5 provides protection to human health and the environment through the site/on-site treatment of the contaminated soils exceeding the remediation risks associated with exposure to these soils is eliminated under this alt

Compliance With Applicable or Relevant and Appropriate Requirements

RAA 5 will comply with all ARARs.

Cost-Effectiveness

The selected remedy, RAA 5, has been evaluated to be, along with RAA 3, th effective of the alternatives considered.

TABLE 9

ESTIMATED COST FOR RAA 5
(SOURCE REMOVAL AND OFF-SITE SOIL RECYCLING)
INTERIM RECORD OF DECISION, CTO-0160
SITE 35 - CAMP GEIGER AREA FUEL FARM
MARINE CORPS BASE, CAMP LEJEUNE, NORTH CAROLINA

Cost Component	RAA 5
Site Preparation	$68,600
Soil Excavation/Staging	100,000
Off-Site Hauling/Disposal	178,500
Site Restoration	43,360
Demobilization	7,800
Distributive Costs	63,200
Engineering and Contingencies	96,907

Total Capital Coat	$558,366

Source: Baker, 1994. Interim Remedial Action Feasibility Study Report, o No. 10, Site 35 - Camp Geiger Area Fuel Farm, Marine Corps Base, North Carolina. Final. Department of the Navy, Atlantic Divisio Engineering Command.

Utilization of Permanent Solutions and Alternative Treatment Technologies

RAA 5 represents a permanent treatment solution. That is, it utilizes, a and alternative treatment technology to the maximum extent practicable.

Preference for Treatment as a Principal Element

RAA 5 satisfies the preference for treatment as a principal element since soil exceeding the remediation goals will be excavated and treated off sit

11.0 RESPONSIVENESS SUMMARY

Overview

At the time of the public comment period (July 26 through August 26, 1994) of the Navy/Marine Corps had already selected a preferred alternative for contaminated soil at operable Unit No. 10 (Site 35). The preferred altern Interim ROD is Source Removal and Off-Site Soil Recycling (RAA 5). This a involves the excavation of contaminated soil located above the seasonal hi table and transport to an off-site commercial facility that utilizes the s basic materials such as bricks and asphalt.

No written comments were received during the public comment period and, ba comments received from the audience at the public meeting of July 26, 1994 appears to support the preferred alternative. In addition, the EPA Region DEHNR are in support of the preferred alternative. Members of the communi the public meeting on July 26, 1994, did not appear to have any opposition alternative.

Background On Community Involvement

A record review of the MCB Camp Lejeune files indicates that the community centers mainly on a social nature, including the community outreach progra base/community clubs. The file search did not locate written Installation Program concerns of the community. A review of historic newspaper article the community is interested in the local drinking and groundwater quality,

the New River, but that there are no expressed interests or concerns speci environmental sites (including Site 35). Two local environmental groups, Environmental Advocates and the Southeastern Watermen's Association, have questions to the base and local officials in the past regarding other envi These groups were sought as interview participants prior to the developmen

Lejeune, IRP, Community Relations Plan. Neither group was available for t

Community relations activities to date are summarized below:

Conducted additional community relations interviews, February throug A total of 41 interviews were conducted with a wide range of persons personnel, residents, local officials, and off-base residents.

Prepared a Community Relations Plan, September 1990.

Conducted additional community relations interviews, August 1993. N persons were interviewed, representing local business, civic groups, residents, military and civilian interests.

Prepared a revised Preliminary Draft Community Relations Plan, Augus

Established two information repositories.

Established the Administrative Record for all of the sites at the ba

Released PRAP for public review in repositories, June 1994.

Released public notice announcing public comment and document availa PRAP, July 20-26, 1994.

Held Technical Review Committee meeting, July 26, 1994, to review PR comments.

Held public meeting on July 26, 1994, to solicit comments and provid Approximately 10 people attended. The public meeting transcript is repositories.

Summary of Comments Received During the Public Comment Period and Agency Responses

As previously mentioned, no comments (written) were received during the pu period. However, several questions/comments were generated at the July 26 meeting. The public meeting was held to discuss the Department of the Nav preferred alternative. A few of the questions pertained to matters that a related to the preferred alternative (e.g., a member of the audience inqui groundwater at the site). These types of questions and answers will not b this Responsiveness Summary; however, specific answers to these questions in the transcript to the public meeting which is contained in Appendix A. also been included in the Administrative Record. A summary of comments pe proposed alternatives and site investigations is given below.

Source of Contamination

(1) One member of the audience at the public meeting inquired as to th soil contamination at Site 35.

Navy/Marine Corps Response: The five aboveground storage tanks (A

associated underground piping which comprise the Fuel Farm at Site
the primary source of the soil contamination. Other sources inclu
adjacent to Building G480 and various reported surface spills of w
documentation is available.

Soil Contamination as a Source of Groundwater Contamination

(1) One member of the audience inquired as to the nature of the subsur
Site 35 and whether the soil contamination identified to date had
be a potential source of groundwater contamination.

Navy/Marine Corps Response: The shallow subsurface geology at Site 35
of sand that extends from the ground surface to a depth of 35 to 40 fee
surface (bgs). The water table aquifer is typically encountered at six
Underlying the sand is a five to 10 feet thick zone of less permeable f

which may serve as an aquitard. This zone appears to be similar to the
been encountered at other Camp Lejeune sites and has been used to demar
portion of the Castle Hayne aquifer. The Castle Hayne aquifer is the p
water supply aquifer at Camp Lejeune.

Based on data obtained to date from Site 35, contamination is present i
table aquifer. The source of this contamination appears to be past dis
Fuel Farm ASTs, associated underground piping, and the UST adjacent to
The nature and extent of soil contamination identified to date is such
be a significant contributor to future additional contamination of site
determination of the nature and extent of groundwater contamination is
the comprehensive RI/FS currently ongoing at Site 35. This study will
whether groundwater contamination has extended to the Castle Hayne aqui

Interim Versus Comprehensive RI/FS

(1) One member of the audience requested an explanation as to the purp
versus comprehensive RI/FS.

Navy/Marine Corps' Response: The Interim RI/FS was focused strictly on
contamination at Site 35 along the area bounded by Brinson Creek to the
to the West, Second Street to the north and, Fourth Street to the south
through Site 35 that the North Carolina Department of Transportation ha
the construction of a new four-lane divided highway. The remediation o
soil in this area was deemed necessary to reduce the environmental impa
Creek and to facilitate the construction of the new highway. Concurren
study, a comprehensive RI/FS was initiated to focus on other media such
sediment, and surface water as well as potentially contaminated soil ou
investigated under the Interim RI/FS.

Remediation

(1) One member of the audience inquired as to Interim Remedial Action
and to the identity of the remediation contractor.

Navy/Marine Corps Response: Baker Environmental, Inc., is responsible through the completion of the remedial design which includes the prepar specifications. Remediation services at Camp Lejeune are procured unde contract. The remediation contractor is OHM Remediation Services Corpo Findlay, Ohio, which is responsible for all subcontracts required to ex remediation.

Appendix A
Transcript: Public Meeting, July 26, 1994

PUBLIC HEARING

ON THE

PROPOSED CLEANUP PLAN

CAMP GEIGER AREA FUEL FARM
MARINE CORPS BASE CAMP LEJEUNE
SITE 35 - OPERABLE UNIT NO. 10
JACKSONVILLE, NORTH CAROLINA

JULY 26, 1994

HELD AT
TARAWA TERRACE ELEMENTARY SCHOOL
CORBIN STREET
JACKSONVILLE, NORTH CAROLINA

REPORTED BY: JAMES A. PALMER, CCR

CAPE FEAR COURT REPORTING

P.O. BOX 1256

WILMINGTON, NORTH CAROLINA 28402

(919) 763-0576

APPEARANCES

DANIEL E. BONK, P.E., PROJECT MANAGER

RAYMOND WATTRAS

BAKER ENVIRONMENTAL, INC.
AIRPORT OFFICE PARK, BUILDING 3
420 ROUSER ROAD
CARAOPOLS, PENNSYLVANIA 15108
(412) 269-6000

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JULY 26, 1994

PROCEEDINGS 7:24 P.M.

MR. BONK: GOOD EVENING. I WOULD LIKE TO--CAN YOU HEAR ME? I WOULD LIKE TO WELCOME EVERYONE TO THE PUBLIC MEETING FOR OUR PROPOSED REMEDIAL ACTION PLAN FOR OPERABLE UNIT 10, OR SITE 35, CAMP GEIGER FUEL FARM.

I WOULD LIRE TO MARE SOME INTRODUCTIONS. MY NAME IS NEAL PAUL AND I'M EMPLOYED HERE BY THE BASE. I'M DIRECTOR OF THE INSTALLATION-RESTORATION DIVISION. MR. WALT HAVEN, WHO IS THE GEOLOGIST WHO WORKS FOR ME IS ALSO HERE. MR. RAY WATTRAS, WHO IS THE PROGRAM MANAGER FOR BAKER ENVIRONMENTAL, OUR CONSULTANT, IS ALSO HERE; MS. KATE LANDMAN, WHO IS THE REMEDIAL

PROJECT MANAGER FROM THE ATLANTA DIVISION OF NAFEC IS HERE; MR. DAN BONK FROM BAKER, MR. TOM BIKSEY, ALSO FROM BAKER; AND OUR OTHER REMEDIAL PROJECT MANAGER, LINDA BERRY; AND LAST BUT NOT LEAST, OUR REGULATORS MR. PATRICK WATTERS FROM THE STATE OF NORTH CAROLINA; MS. GEENA TOWNSEND FROM EPA REGION 4.

THE PURPOSE OF THIS MEETING IS REALLY JUST TO DISSEMINATE SOME INFORMATION ON WHAT OUR PLANS ARE IN CLEANING UP THIS SITE. JUST TO LET EVERYONE KNOW, THE HIGHWAY 17 BYPASS THAT HAS BEEN MUCH TALKED ABOUT IN EASTERN NORTH CAROLINA IN THE LAST YEAR IS GOING TO COME DIRECTLY OVER TOP OF THIS SITE. THIS IS GOING TO BE AN INTERIM REMEDIAL ACTION AND NOT THE FINAL REMEDIAL ACTION OF THIS SITE TO FACILITATE THAT HIGHWAY AND PRECLUDE ANY DELAYS THAT MAY--THAT WOULD HAVE PROBABLY ACCOMPANIED IT HAD WE NOT TAKEN THIS REMEDIAL ACTION.

MR. RAY WATTRAS FROM BARER WILL BE PRESENTING THE SITE SPECIFICS ON THE REMEDIAL ACTION PLAN. RAY?

MR. WATTRAS: THANK YOU, NEAL.

MR. PAUL: I FORGOT TO SAY ONE OTHER THING. THE PUBLIC COMMENT PERIOD WILL BEGIN TODAY AND END AUGUST 26 OF 1994. THE PROPOSED REMEDIAL ACTION PLAN IS IN WALT AND MYSELF'S OFFICE, WHICH IS BUILDING 67 ABOARD THE BASE. TO ACCESS IT, IT WOULD PROBABLY BE GOOD TO GIVE US A CALL AT 451-5068, OR THE ONSLOW COUNTY LIBRARY SHOULD HAVEE THE COMPLETE ADMINISTRATIVE RECORD. SO, MR. WATTRAS WILL NOW PRESENT THE PROPOSED PLAN.

MR. WATTRAS: THANK YOU VERY MUCH AND THANK

YOU FOR COMING TONIGHT. WE ARE GLAD TO HAVE YOU HERE. DURING MY DISCUSSION, AS NEAL MENTIONED, WE ARE GOING TO TALK ABOUT SITE 35 AT CAMP LEJEUNE. IT'S CALLED THE CAMP GEIGER FUEL DUMP.

DURING MY DISCUSSION FEEL FREE TO INTERRUPT ME IF YOU HAVE ANY QUESTIONS. IF I SAY SOMETHING YOU DON'T QUITE UNDERSTAND, DON'T HESITATE. WE WOULD ASK, IF YOU DO HAVE A QUESTION, FOR PURPOSES OF RECORDING IT, STATE YOUR NAME AND THEN PROVIDE YOUR QUESTION.

IF YOU DON'T FEEL LIKE ASKING A QUESTION DURING THE MEETING HERE, AFTERWARDS COME UP TO US. ASK US ANY QUESTIONS THAT YOU WOULD LIKE; WRITE QUESTIONS ON A SLIP OF PAPER AND WE WILL SEE THAT YOU GET AN ANSWER.

SITE 35, AS I MENTIONED, IS CALLED THE CAMP GEIGER FUEL FARM. THIS SITE HAS BEEN STUDIED FOR A NUMBER OF YEARS. PREVIOUS INVESTIGATIONS HAVE IDENTIFIED SOIL CONTAMINATED WITH PETROLEUM PRODUCTS. IT HAS BEEN DETERMINED THAT THE SOIL CONTAMINATION DOES NOT PRESENT A SIGNIFICANT HEALTH RISK OR ENVIRONMENTAL RISK, PRIMARILY BECAUSE MOST OF THE CONTAMINATION IS BELOW THE SUBSURFACE, WHICH WE WILL GET INTO LATER ON. THIS CLEANUP ACTION, THOUGH, IS GOING TO FOCUS ON THIS PETROLEUM CONTAMINATION.

ALTHOUGH THE CONTAMINANT LEVELS DON'T POSE ANY REAL OR SIGNIFICANT RISK TO THE PEOPLE THAT WORK OUT THERE OR TO THE ENVIRONMENT IN THE AREA, THERE ARE LEVELS OF PETROLEUM HYDROCARBONS WHICH EXCEED STATE STANDARDS. AND AS NEAL MENTIONED, THE HIGHWAY THAT IS TO BE BUILT IN THE AREA WILL BE

COMING RIGHT THROUGH THAT AREA. BEFORE THEY CAN BUILD THAT, WE NEED TO GO IN THERE AND REMEDIATE THAT SOIL, OR CLEAN THAT SOIL UP.

AND SITE 35 IS LOCATED UP AT CAMP GEIGER. CAMP GEIGER, IF YOU DON'T KNOW WHERE IT IS, IT'S LOCATED RIGHT ALONG ROUTE 17, SOUTH OF JACKSONVILLE. THE SITE, ITSELF, REFERS TO FIVE 15,000 GALLON ABOVE-GROUND STORAGE TANKS WHICH HAVE BEEN IN OPERATION SINCE BACK IN 1945 WHEN THE FUEL FACILITY WAS FIRST BUILT. AND THESE ABOVE-GROUND STORAGE TANKS HOLD PETROLEUM PRODUCTS SUCH AS HEATING FUEL, DIESEL FUEL AND GASOLINE.

AS I MENTIONED BEFORE, THE SITE IS LOCATED JUST SOUTH OF JACKSONVILLE, RIGHT UP HERE. THERE ARE THE FIVE ABOVE-GROUND

STORAGE TANKS. BENEATH THIS AREA, THERE IS PIPING THROUGHOUT. PIPING GOING TO VARIOUS DISPENSING BUILDINGS. THERE ARE SOME UNDERGROUND STORAGE TANKS IN THE AREA THAT PIPING LEADS TO.

THERE HAVE BEEN VARIOUS REPORTS OF SPILLS DATING BACK TO 1950. SPILLS OCCUR IN A VARIETY OF WAYS. SOMETIMES BY FILLING UP THE TANKS AND OVERFLOWS. YOU CAN HAVE SPILLAGE THAT WAY. OTHER TIMES YOU HAVE PIPES THAT MAY LEAK AND YOU CAN HAVE REPORTED LOSS OF PETROLEUM PRODUCT IN THAT MANNER.

IN SOME CASES DUE TO THE AMOUNT OF FUEL LEAKING OR SPILLING FROM THE FACILITY, THEY ACTUALLY HAD TO EXCAVATE TRENCHES TO COLLECT THE FUEL, AND THEY WOULD ALSO REMOVE ANY OF THE CONTAMINATED SOIL FROM THE TRENCH AREA.

I MENTIONED BEFORE THERE HAVE BEEN QUITE A NUMBER OF INVESTIGATIONS CONDUCTED, DATING BACK TO 1983. MOST OF THERE

INVESTIGATIONS HAVE BEEN INVOLVED WITH THIS FUEL FACILITY.

THE HIGHWAY IS PROPOSED TO BE BUILT IN THE SUMMER OF 1995. AND BEFORE THAT HIGHWAY CAN BE PUT IN, A NUMBER OF BUILDINGS HAVE TO BE TAKEN DOWN; AND, ALSO, THE FUEL FARM, ITSELF. AND THAT IS BEING SCHEDULED FOR DECEMBER OF THIS YEAR.

THE STUDIES CONDUCTED TO DATE HAVE IDENTIFIED A FEW AREAS OF SOIL CONTAMINATION WITH PETROLEUM PRODUCT. IN ADDITION, BY PUTTING IN MONITORING WELLS, THEY HAVE IDENTIFIED PLUMES OF PETROLEUM SOLVENTS, OR PETROLEUM PRODUCTS IN GROUNDWATER AS WELL AS SOLVENTS IN GROUNDWATER. THE SOLVENTS WERE NOT EXPECTED. TYPICALLY FROM A FUEL FACILITY, YOU EXPECT

TO FIND CONTAMINANTS ASSOCIATED WITH GASOLINE AND DIESEL. BUT IN THE INVESTIGATIONS, THEY ALSO HAD CONTAMINANTS IN GROUNDWATER SUCH AS TRICHLOROETHANE WHICH IS A SOLVENT.

ALSO MENTIONED, TO DATE, THE PREVIOUS INVESTIGATIONS THAT WERE CONDUCTED REALLY DIDN'T ANALYZE FOR SOLVENTS IN SOIL. BECAUSE OF THE FACT THAT THEY ARE DEALING WITH A FUEL FACILITY, THE LOGICAL APPROACH IS TO LOOK FOR THINGS THAT YOU WOULD ASSOCIATE WITH FUEL SUCH AS PETROLEUM HYDROCARBONS, BENZINE, XYLENES AND OTHER CONTAMINANTS LIKE THAT.

TO POINT OUT A COUPLE OF THINGS ON THIS FIGURE HERE. THESE ARE THE GROUNDWATER PLUMES THAT I'VE JUST MENTIONED. RIGHT HERE IN THIS GRAY AREA ARE THE FIVE ABOVE-GROUND STORAGE TANKS. THE AREA OUTLINED IN GREEN IS A GROUNDWATER PROBLEM, SHALLOW GROUNDWATER PROBLEM, WHICH IS CONTAMINATED WITH PETROLEUM HYDROCARBONS. WE HAVE ONE FROM THIS FUEL FACILITY AND

ONE FROM ANOTHER AREA UP IN THIS AREA. NOW, THERE IS A SMALL FUEL OIL TANK RIGHT HERE THAT WE'RE LOOKING AT.

THE OTHER BOUNDARY THAT YOU WILL SEE ON HERE IS THE SOLVENTS THAT SHOWED UP IN GROUNDWATER. THERE WAS A SMALL PLUME IDENTIFIED DOWN IN THIS AREA, A LARGER ONE COMING FROM THIS AREA, AND A THIRD ONE SOUTH OF THE SITE.

LET ME BACK UP ONE SLIDE. BRINSON CREEK IS LOCATED JUST TO THE EAST OF THIS SITE. AND AS YOU KNOW, BRINSON CREEK GOES ALL THE WAY UP TO ROUTE 17 AND THE HEADWATERS ARE ACTUALLY JUST BEYOND ROUTE 17. AND THIS IS A PICTURE OF BRINSON CREEK.

ONE OTHER THING I WOULD LIKE TO MENTION. WE'RE TALKING TONIGHT ABOUT SOIL CONTAMINATION AND WHAT WE'RE GOING TO DO TO CLEAN IT UP. WE ARE ALSO INVOLVED WITH ANOTHER STUDY. WE ARE LOOKING AT THE GROUNDWATER JUST NOW. IT'S JUST THAT WE'RE FAST-TRACKING THE SOIL TO, NUMBER ONE, DO SOMETHING ABOUT IT; AND NUMBER 2, TO DO SOMETHING ABOUT IT IN TIME FOR THE HIGHWAY TO COME THROUGH. SO, WE ARE LOOKING AT THE GROUNDWATER. WE JUST COMPLETED OUR FIELD INVESTIGATION BACK IN JUNE.

IS THAT RIGHT, DAN?

MR. BONK: YES.

MR. WATTRAS: AND WE ALSO LOOKED AT THE SURFACE DOWN IN BRINSON CREEK. WE LOOKED AT SURFACE WATER AND SEDIMENTS, AS WELL AS THE AQUATIC WILD LIFE.

THE STUDY THAT I WA JUST TALKING ABOUT, WE BEGAN IN 1993, AND WE JUST GOT OUT OF THE FIELD IN JUNE OF 1994. PART OF THIS STUDY FOCUSED JUST ON CONTAMINATED SOIL. NOW, THERE ARE A

LOT OF STUDIES DONE TO DATE. WE LOOKED AT THAT INFORMATION. IT'S GOOD INFORMATION, BUT WE FELT IN ORDER TO DO AN ENGINEERING STUDY, THERE WERE STILL A FEW PIECES OF INFORMATION THAT WE WOULD LIKE TO HAVE; SO, WE CONDUCTED A LIMITED INVESTIGATION. WE ONLY NEEDED ABOUT SEVEN SHALLOW SOIL BORINGS, AND WE COLLECTED ABOUT 13 SURFACE SOIL SAMPLES. WE WANTED TO TAKE A LOOK AT WHAT IS ON THE SURFACE BECAUSE ONE OF THE THINGS WE HAVE TO LOOK AT ARE IMPACTS TO HUMAN HEALTH. AND WE DID A SMALL TRENCH EXCAVATION.

THE RESULTS PRETTY MUCH CONFIRMED THE PREVIOUS INVESTIGATIONS. THEY DID SUPPLEMENT THE INVESTIGATIONS FROM THE STANDPOINT OF WHAT WE WERE REALLY TRYING TO DO, IS GET A BETTER HANDLE ON THE EXTENT OF CONTAMINATION. THAT'S IMPORTANT, OBVIOUSLY, IN THE ENGINEERING SIDE OF THINGS. WHEN YOU GO TO CLEAN IT UP, YOU WANT TO HAVE A PRETTY GOOD IDEA OF HOW MUCH SOIL WAS CONTAMINATED AND SO FORTH.

SO, WE DID IDENTIFY THE FOUR AREAS AND WE HAVE A PRETTY GOOD FEEL FOR THE EXTENT OF THAT SOIL CONTAMINATION. I WOULD LIKE TO POINT OUT, TOO, THAT MOST OF THE SOIL CONTAMINATION IS BELOW THE SURFACE AT ABOUT THREE TO SIX FEET.

BASED ON OUR RESULTS--AND WE LOOK AT IT FROM THE STANDPOINT OF THE PEOPLE THAT WORK THERE. WE ALSO LOOK AT IT FROM THE STANDPOINT THE CONSTRUCTION WORKERS WILL BE DIGGING THIS SOIL UP. BASED ON THE LEVELS OF CONTAMINATION, WE LOOKED AT THOSE EXPOSURE SCENARIOS AND DETERMINED THAT THERE WOULD BE NO REAL SIGNIFICANT HUMAN HEALTH RISK.

THE THING THAT IS CLEANING UP THIS ACTION, AS I MENTIONED BEORE, IS PRIMARILY RELATED TO THE STATE GUIDELINES FOR TPH. ONCE THE CONTRACTOR COMES IN TO PUT THE HIGHWAY IN, IF THAT CONTRACTOR WOULD RUN INTO SOIL CONTAMINATED WITH PETROLEUM PRODUCTS, THEY WOULD HAVE TO DISPOSE OF IT PROPERLY AND THEY WOULD HAVE TO CLEAN UP TO A LEVEL THAT WOULD MEET THE STATE GUIDELINES. THAT'S WHY WE'RE DOING THIS, TO GET RID OF THAT SO THAT THEY DON'T RUN INTO ANY OBSTACLES PUTTING THAT HIGHWAY IN.

THIS IS JUST A PICTURE OF THE TRENCH THAT WE DUG THROUGH THERE. THE PURPOSE OF THAT TRENCH WAS REALLY TO GET A FEEL FOR--IF THEY START DIGGING, MEANING EXCAVATION OF THE HIGHWAY, WE DIDN'T WANT ANY SURPRISES SUCH AS PRODUCT FLOWING INTO AN EXCAVATION. SO, WE DECIDED TO PUT A TRENCH ABOUT, I GUESS--DAN, HOW LONG WAS THAT TRENCH, ABOUT 100 YARDS OR SO, OR LONGER?

MR. BONK: NO, IT WAS LONGER. MAYBE SIX OR SEVEN-HUNDRED FEET.

MR. WATTRAS: AND IT WENT DOWN ABOUT WHAT, A FOOT AND A HALF, TWO FEET?

MR. BONK: ABOUT TWO FEET. AND IT WAS PURPOSELY PUT INTO A LOW AREA WITH THE THINKING THAT ANY CONTAMINATION WOULD HAVE FLOWED FROM THE HIGHER ELEVATIONS TO THE LOWER ELEVATIONS. SO, IT WAS IN THE MOST LIKELY POSITION. IT WAS VERY CLOSE TO THE GROUNDWATER. WE JUST WANTED TO GET A LONG LOOK AT THE AREA.

MR. WATTRAS: AGAIN, BASED ON OUR

EXPERIENCE AT OTHER SIMILAR SITES--WE RAN INTO A SITUATION ONE TIME WHERE A CONTRACTOR STARTED TO DIG A TRENCH, OR STARTED TO EXCAVATE, AND CAME BACK THE NEXT MORNING AND IT WAS FILLED UP WITH PRODUCT. SO, WE SAID AHEAD OF TIME, LET'S SEE WHAT HAPPENS WITH DIGGING A TRENCH. AND THAT'S THE SOLE PURPOSE OF PUTTING THIS TRENCH IN, IS TO ELIMINATING ANY SURPRISES DOWN THE ROAD.

MS. WOOD: WHERE IS THE WATER TABLE THERE?

MR. WATTRAS: PARDON ME?

MS. WOOD: WHERE IS THE WATER TABLE THERE?

MR. WATTRAS: THE WATER TABLE IS ABOUT SIX TO SEVEN FEET, DAN?

MR. BONK: OVER MOST OF THE SITE THE WATER TABLE IS ABOUT SIX TO SEVEN FEET BELOW THE GROUND SURFACE. BUT THERE ARE TWO--BASICALLY TWO LAYERS TO OUR SITE WITH THE FLAT PORTION WHERE THE TANKS ARE LOCATED, THE GROUNDWATER IS ABOUT SIX OR SEVEN FEET DOWN, AND THEN IT DROPS OFF TOWARDS THE CREEK. SO, BASICALLY, THE GROUND WATER MEETS THE CREEK AT THAT POINT. SO, IN BETWEEN, YOU MAY BE THREE FEET, OR TWO FEET, OR WHATEVER.

MR. WATTRAS: OKAY. THE CLEANUP GOALS THAT WE ESTABLISHED WERE BASED ON A SITE SENSITIVITY EVALUATION. IT IS A CHECK LIST, IT IS A FORM THAT YOU FILL OUT, IT IS A NORTH CAROLINA ACTION LEVEL. AND IT TAKES INTO CONSIDERATION SUCH THINGS AT THE DEPTH OF THE GROUNDWATER, LOCAL POPULATION. AND

YOU FILL OUT INFORMATION ON THIS FORM AND IT CALCULATES AN ACTION LEVEL THAT THEY WOULD LIKE YOU TO CLEAN UP TO.

IN OUR CASE, WE'RE LOOKING AT TPH, WE LOOKED AT TWO ACTION LEVELS: ONE THAT WOULD BE ASSOCIATED WITH THE LIGHTER COMPOUND SUCH AS GASOLINE. AND THAT'S GOING TO BE 40 PARTS PER MILLION. THE OTHER ACTION LEVEL INVOLVES A TPH ANALYSIS THAT LOOKS AT DIESEL, AND THAT'S A LITTLE BIT MORE OF A HEAVIER FUEL. AND THAT ACTION LEVEL IS ROUGHLY 150 PARTS PER MILLION.

I BELIEVE THIS FIGURE THAT'S HERE THAT'S UP ON THIS SLIDE IS THE SAME ONE THAT'S PRINTED UP ON THE POSTERS. SO, IF YOU CAN'T READ IT, MAYBER LATER ON YOU WOULD LIKE TO TAKE A LOOK AT THAT POSTER AND WE CAN DISCUSS IT.

THERE ARE FOUR AREAS THAT WILL BE EXCAVATED. THE ONE OBVIOUS AREA IS RIGHT BELOW THE ABOVE-GROUND STORAGE TANKS. ALTHOUGH NO SAMPLES WERE TAKEN RIGHT BELOW THESE TANKS, RIGHT NOW THERE IS A CONCRETE LAYER THAT YOU REALLY WOULD HAVE TO BUST UP TO GET TO, WE ASSUME WITH PIPING, THAT ONCE THEY REMOVE THOSE TANKS, THERE IS PROBABLY GOING TO BE STAINED SOILS AND PETROLEUM CONTAMINATED SOILS. THAT'S BASED ON EXPERIENCE. ON A LOT OF TANK SITES, THAT'S WHAT YOU FIND WHEN YOU PULL THEM. SO, WE ASSUME RIGHT NOW THERE WILL BE SOME SOIL THAT WILL NEED TO BE TAKEN OUT WHEN THEY DISMANTLE THIS FACILITY.

TWO OTHER AREAS ARE LOCATED NORTH OF HERE. ONE IS UP JUST NORTH OF THIS SITE, AND ANOTHER ONE TO THE NORTHWEST OF THIS SITE. AND THEN THERE IS THE THIRD AREA. I MENTIONED BRIEFLY BEFORE THAT THERE WAS AN UNDERGROUND STORAGE TANK THAT

CONTAINED FUEL OIL. BASED ON OUR SOIL RESULTS, THERE IS SOME SOIL CONTAMINATION HERE.

YOU MIGHT BE ABLE TO SEE IT ON HERE. THIS IS THE LOCATION OF THE FOUR-LANE HIGHWAY GOING THROUGH. SO, IT IS COMING RIGHT THROUGH THE CENTER OF THE SITE.

AGAIN, THE SOIL, WE ARE GOING TO HAVE TO EXCAVATE ABOUT TWO TO THREE FEET OF CLEAN SOIL, STOCKPILE IT IN A CERTAIN AREA, THEN GET THE CONTAMINATED SOIL. WE WILL EXCAVATE DOWN PROBABLY JUST TO THE TOP OF THE WATER TABLE, AND THEN IT WOULD BE BACKFILLED WITH CLEAN SOIL AGAIN.

WE LOOKED AT SIX ALTERNATIVEES IN DEALING WITH THIS PROBLEM. ONE ALTERNATIVE THAT WE ALWAYS CONSIDER IS THE NO-ACTION ALTERNATIVE. THAT MEANS DO NOTHING. THAT'S ALWAYS AN ALTERNATIVE. SOMETIMES YOU END UP NOT DOING ANYTHING AT A SITE BECAUSE AFTER STUDYING IT, YOU FIND OUT THAT THERE IS REALLY NO IMPACT OF THE PROBLEM. BUT NO ACTION IS ALSO USED AS A BASELINE TO MEASURE THE OTHER ALTERNATIVES.

THE SECOND ALTERNATIVE WOULD INVOLVE THE REMOVAL OF THE CONTAMINATED SOIL AND WE WOULD TAKE IT TO AN OFF-SITE LANDFILL THAT WOULD BE PERMITTED TO ACCEPT PETROLEUM WASTE.

THE THIRD ALTERNATIVE INVOLVES EXCAVATION OF THE SOIL IN TAKING IT OFF SITE TO A BIOTREATMENT FACILITY. HERE THAT FACILITY WOULD TAKE IT. IT PROBABLY WOULD INVOLVE LAND FARMING WHERE OVER TIME THOSE PETROLEUM LEVELS WOULD DEGRADE.

THE FOURTH ALTERNATIVE INVOLVES EXCAVATION OF THE SOILS IN WHAT'S CALLED SOIL AERATION. SOIL AERATION IS SIMPLY

WHEN YOU EXCAVATE OR YOU LIFT THE SOIL UP AND YOU AERATE IT. YOU DROP IT, YOU PICK IT UP AGAIN, YOU MOVE IT AROUND AND IT VOLATILIZES OUT OF THE SOIL. IT COULD EITHER VOLATILIZE DIRECTLY TO THE ATMOSPHERE, OR IT COULD BE COLLECTED IN HOODS

THAT CAPTURE THESE CONTAMINANTS.

THE FIFTH ALTERNATIVE INVOLVES SOURCE REMOVAL AND OFF-SITE SOIL RECYCLING. THERE ARE A NUMBER OF FACILITIES IN THIS GENERAL AREA THAT WOULD RECYCLE THIS TYPE OF MATERIAL. THEY COULD MAKE IT INTO ASPHALT OR INTO BRICKS.

AND THE SIXTH ALTERENATIVE INVOLVES EXCAVATION AND ON-SITE THERMAL DESORPTION, WHICH IS ESSENTIALLY LIKE BAKING THE SOIL. IT BAKES IT TO A TEMPERATURE WHERE IT WOULD NOT TURN INTO ASH, BUT IT VOLATILIZES OUT THE CONTAMINANTS. AND THEN THAT SOIL WOULD BE USED AS BACKFILL.

THESE ALTERNATES RANGED ANYWHERE FROM ZERO, IF WE DO NOTHING, ALL THE WAY TO ABOUT SIX-HUNDRED-THOUSAND DOLLARS. YOU NOTICE, OTHER THAN THE NO ACTION ALTERNATIVE, THE LEAST EXPENSIVE IS ALTERNATIVE NUMBER FOUR, WHICH I MENTIONED IS THE SOIL AERATION ALTERNATIVE. THAT ONE ALSO HAS THE HIGHEST RISK INVOLVED. BECAUSE OF THE TIME FRAME INVOLVED HERE, WE DID NOT PERFORM ANY TREATABILITY STUDIES TO SEE BY AERATING THE SOIL CAN WE GET DOWN TO THE ACTION LEVELS THAT THE STATE WOULD LIKE US TO GET DOWN TO. IF WE DON'T GET DOWN TO THE ACTION LEVELS, THAT MEANS ONE THING. YOU KEEP AERATING IT, WHICH MEANS TIME, AND TIME MEANS MONEY; SO, THERE IS A LOT OF RISK IN THAT ALTERNATIVE.

THE SECOND LEAST EXPENSIVE ALTERNATIVE IS ALTERNATIVE NUMBER TWO WHERE WE WOULD SIMPLY EXCAVATE IT AND TAKE IT OFF TO A LANDFILL. THAT ALTERNATIVE IS NOT MUCH CHEAPER OR EXPENSIVE AS SOME OF THE OTHERS. AND WITHOUT TREATING IT, IT'S NOT--IT'S ACCEPTABLE BUT IT'S NOT THE PREFERRED ALTERNATIVE, ESPECIALLY WHEN THERE ARE OTHER ALTERNATIVES WITHIN A CLOSE RANGE OF MONEY HERE THAT WOULD ACTUALLY TREAT THE SOIL.

THE OTHER TWO ALTERNATIVES, TAKING IT TO AN OFF-SITE BIOREMEDIATION FIRM, AND ALTERNATIVE NUMBER FIVE, RECYCLING, WERE PRETTY MUCH THE SAME COST. AND FINALLY, THE LAST AND THE MOST EXPENSIVE ALTERNATIVE ENDED UP BEING THE THERMAL DESORPTION ALTERNATIVE.

THE ALTERNATIVE BEING PROPOSED BY THE NAVY MARINE CORPS IS ALTERNATIVE NUMBER FIVE. THIS WOULD INVOLVE EXCAVATION OF THE SOIL AND TAKING IT TO AN OFF-SITE SOIL RECYCLING FACILITY. BECAUSE THERE ARE A NUMBER OF FACILITIES IN THIS AREA, WE FELT WE WOULD BE ABLE TO GET COMPETITIVE BIDS WHICH COULD POSSIBLY EVEN DECREASE THE COST OF THIS ALTERNATIVE. BUT SOIL RECYCLING IS AN ACCEPTABLE ALTERNATIVE. PETROLEUM CONTAMINATED SOILS ARE USED A LOT IN ASPHALT PRODUCTION AND BRICK BAKING.

I BELIEVE THAT'S OUR PRESENTATION. I WOULD LIKE TO ENTERTAIN ANY QUESTIONS RIGHT NOW.

MS. WOOD: WHERE DO YOU BELIEVE THE CONTAMINATION CAME FROM?

MR. WATTRAS: WE ALL BELIEVE IT CAME FROM

AN UNDERGROUND STORAGE TANK. OUR RECORDS INDICATE THAT ALL THE UNDERGROUND STORAGE TANKS IN THE AREA ARE RELATED TO PETROLEUM

FUELS AND SO FORTH. THERE ARE A NUMBER OF MAINTENANCE FACILITIES IN THE AREA. AND WITH ANY MAINTENANCE FACILITY, YOU HAVE DEGREASING OPERATIONS. AND IT IS LIKELY THAT OVER THE YEARS SMALL SPILLS HAVE OCCURRED. THAT'S WHAT WE'RE LOOKING AT RIGHT NOW. AND AS PART OF THE COMPREHENSIVE STUDY, WE ARE LOOKING AT GROUND WATER IN BRINSON CREEK. WE'VE TAKEN A NUMBER OF SOIL SAMPLES FROM DIFFERENT AREAS AND ANALYZED THEM FROM SOLVENT CONSTITUENTS TO FIND OUT WHERE THE SOURCE MIGHT BE.

NOW, I KNOW FROM EXPERIENCE DOWN HERE AT CAMP LEJEUNE, A LOT OF THESE SPILLS OCCURRED SUCH A LONG TIME AGO THROUGHOUT THE YEARS, I WOULD NOT BE SURPRISED-BECAUSE WE'VE SEEN THIS AT OTHER SITES-THAT IT MIGHT NOT BE IN THE SOIL MATRIX ANY MORE. THROUGH THIRTY-FORTY YEARS OF OPERATIONS AND INFILTRATION OF RAIN AND SO FORTH, IN THOSE TYPES OF SOLVENTS ARE VERY-THEY MIGRATE VERY RAPIDLY IN THE ENVIRONMENT. THEY COULD HAVE BEEN WASHED RIGHT DOWN TO THE WATER TABLE. SO, THEY MAY NO LONGER BE IN THE SOIL, BUT THEY ARE JUST SITTING IN THE GROUND WATER.

MS. WOOD: WELL, WHAT IS THE LAND STRUCTURE DOWN HERE? ARE YOU NOT WORRIED ABOUT YOUR AQUIFER?

MR. WATTRAS: WE HAVE A PRETTY GOOD PICTURE OF IT. AT ABOUT 35 TO 40 FEET THERE IS A SEMI-CONFINING CLAY LAYER, DAN, WOULD YOU SAY?

MR. BONK: IN GENERAL WE SEE THE TYPICAL SAND MATERIAL THAT YOU WOULD PICK UP EVEN OUTSIDE HERE FOR ABOUT

35 TO 40 FEET. THEN WE HAVE--BETWEEN 40 AND 45 FEET, WE HAVE

HIT A MORE CLAY ZONE. WHETHER IT'S CONTINUOUS ENOUGH TO BE CONSIDERED SOMETHING THAT WOULD HOLD THE CONTAMINATION ABOVE IT IS PART OF WHAT OUR STUDY WAS SUPPOSED TO DETERMINE BECAUSE WE DID SET WELLS ABOVE AND BELOW THAT ZONE, AND WE SHOULD BE ABLE TO ANSWER THAT QUESTION. BUT THERE IS A LENS AT ABOUT 40 FEET WHICH WE HOPE IS A CONFINING LAYER AND WE WILL DETERMINE THAT.

MS. WOOD: WELL, ONE OTHER QUESTION. WOULD YOU DIFFERENTIATE BETWEEN YOUR INTERIM ACTION AND THEN YOUR LONG TERM? AS I UNDERSTAND, YOU WANTED TO GET THE DIRT OUT--

MR. WATTRAS: YES.

MS. WOOD: --SO THAT THE HIGHWAY CAN GO THROUGH. BUT THEN, WHERE IS THE LONGER TERM--

MR. WATTRAS: SIMPLY PUT, THE INTERIM ACTION FOCUSES ON THE SOIL; THE LONG TERM WILL FOCUS ON THE GROUND WATER, POSSIBLY MORE SOIL, IF WE CAN ASSOCIATE IT WITH THIS GROUNDWATER PROBLEM, AND ALSO IF WE FIND ANY PROBLEMS WITH BRINSON CREEK, ITSELF. SO, THAT'S A MORE COMPREHENSIVE PICTURE. BUT IT'S PRIMARILY GOING--IT LOOKS LIKE IT WOULD BE MAINLY FOCUSED ON GROUNDWATER.

MS. WOOD: WELL, NOW ON THE BIDS, WHO TAKES THE BIDS?

MR. WATTRAS: WELL, I TALKED ABOUT BIDDING BEFORE. THERE IS A CONTRACTOR. BAKER ENVIRONMENTAL IS INVOLVED FROM THE INVESTIGATION STAGE. WE DO THE RISK ASSESSMENTS AND

THEN WE DO THE DESIGN OF THE ALTERNATIVE. THE DEPARTMENT OF THE NAVY HAS ANOTHER CONTRACTING MECHANISM, AND THERE IS ANOTHER COMPANY--IT'S CALLED OHM--IT DOESN'T STAND FOR ANYTHING. BUT THEY ARE FROM FINDLAY, OHIO. THEY HAVE OFFICES--IN FACT, THE OFFICE THAT NEAL IS DEALING WITH IS OUT OF NORCROSS, GEORGIA. BUT THAT COMPANY HAS THE CONTRACT TO DO THE REMEDIATION HERE AT CAMP LEJEUNE.

THAT COMPANY WOULD DO THIS WORK. OHM DOES NOT OWN RECYCLING FACILITIES. THEY WOULD TAKE THAT SOIL. AND IT IS UP TO THEM. THEY WOULD GO OUT FOR COMPETITIVE BIDS TO THE LOCAL RECYCLING CENTERS HERE AND TRY TO GET THE LOWEST COST.

MS. WOOD: SO, NORFOLK IS NOT GOING TO BE INVOLVED IN THE BIDDING?

MR. WATTRAS: NO.

MR. PAUL: DID YOU SAY NORFOLK? THAT WOULD ADMINISTER THE CONTRACT, BUT THAT--WHEN YOU SAY INVOLVED--

MS. WOOD: I MEAN, THEY ARE NOT ACCEPTING THE BIDS? IT'S OHM.

MR. PAUL: IT'S OHM, THAT'S RIGHT.

MR. WATTRAS: OKAY.

ANY OTHER QUESTIONS? FEEL FREE TO STICK AROUND AND IF YOU HAVE ANYTHING YOU WANT TO TALK ABOUT ON THE POSTER BOARDS, FEEL FREE TO DO SO.

MS. WOOD: WAS THIS THE ONE? I THINK I GET CONFUSED ON THIS. WAS THIS THE ONE WHERE THEY HAD THE BIG

SPILL AND THEY HAD THE FIRE AND THEN THE RECORDS WERE DESTROYED.

MR. WATTRAS: YES.

MS. WOOD: BUT THOSE RECORDS WERE REALLY--

MR. WATTRAS: WE CANNOT FIND--DOCUMENTATION THROUGHOUT THE BASE OF PAST EVENTS IS POOR, TO PUT IT BLUNTLY. WE DID HEAR THAT THERE WAS A FUEL SPILL. AND THIS WAS THE EVENT WHERE YOU TALKED ABOUT THAT THEY ACTUALLY LIT IT ON FIRE AND THAT'S HOW THEY GOT RID OF IT. AND IT IS PROBABLY ASSOCIATED WITH ONE OF OUR AREAS THAT WE HAD CIRCLED UP THERE THAT HAS SOIL CONTAMINATION. WE THINK, ANYWAY. YOU KNOW, WE ARE NOT EVEN QUITE SURE WHERE THE EXACT SPILL WAS, BUT WE THINK IT MIGHT BE IN THIS ONE AREA, AND IT HAPPENS TO BE ONE OF THE AREAS THAT WILL BE REMEDIATED. SO, THE DOCUMENTATION IS VERY POOR.

OKAY. NEAL, WOULD YOU LIKE TO SAY ANYTHING ELSE?

MR. PAUL: I DON'T HAVE ANYTHING ELSE. WE PROBABLY WILL BE HERE FOR ANOTHER FIFTEEN OR TWENTY MINUTES. SO, IF FOR SOME REASON YOU DIDN'T ASK A QUESTION IN THIS FORM, FEEL FREE TO, AS WE BREAK UP AND IT'S GOING TO BE INFORMAL. WE WILL PROBABLY JUST BE AROUND HERE FOR FIFTEEN OR TWENTY MINUTES. SO, FEEL FREE, IF YOU HAVE ANY QUESTIONS, TO ASK US. WE WOULD LOVE TO ANSWER THEM FOR YOU. AND TOMORROW NIGHT, THERE WILL ALSO BE ANOTHER PUBLIC MEEETING TOMORROW NIGHT FOR UNITS ONE AND FIVE TO DISCUSS OUR REMEDIAL ACTION PLANS FOR THOSE AS WELL.

AND AGAIN, THANK YOU FOR COMING TONIGHT.

(WHEREUPON, THE PUBLIC HEARING IN THE CAMP GEIGER FUEL

2 FARM PROPOSED CLEAN UP WAS CLOSED AT 8:05 P.M.)

I CERTIFY THAT THE FOREGOING IS A CORRECT TRANSCRIPT FROM THE RECORD OF PROCEEDINGS IN THE ABOVE-ENTITLED MATTER.

JAMES A PALMER, CCR

DATE